REMARKS

Favorable reconsideration of this application, in view of the present amendments and in light of the following discussion, is respectfully requested.

This amendment is submitted in accordance with 37 C.F.R. § 1.116 which, after final rejection, permits the entry of amendments cancelling claims, complying with any requirement of form expressly set forth in a previous office action, or presenting rejected claims in better form for consideration on appeal. The present amendment places the claims in condition for allowance without requiring further search and/or consideration. Therefore, it is respectfully requested that the present amendment be entered under 37 C.F.R. § 1.116.

Claims 9-20 are pending. Claims 9, 12-13, 14 and 19-20 are amended to further clarify the features contained therein. No new matter is introduced.

In the outstanding Office Action, Claim 9 was rejected as being unpatentable over the background in view of Feld (U.S. Patent No. 6,281,755); Claims 10, 17 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the background, Feld and Kaczynski (U.S. Patent Application Publication No. 2007/0111684); Claims 12-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the background, Feld, Shohara (U.S. Patent Application Publication No. 2005/0078743) and Wilhelmsson (U.S. Patent Application Publication No. 2007/0211831); Claim 14 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the background in view of Kasuga (U.S. Patent No. 4,524,422); Claims 15-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the background, Feld, Kasuga and Daners (U.S. Patent No. 6,229,393); and Claims 19-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the background, Kasuga, Shohara and Wilhelmsson.

In reply to the rejection of Claim 9 as being unpatentable over the background in view of Feld, Claim 9 is amended to recite, *inter alia*, a wide-band amplifier that includes:

an input terminal configured to receive an input voltage;

an output terminal configured to provide an output voltage;

an amplification device connected in series between the input terminal and the output terminal, an output of the amplification device being directly connected to the output terminal;

an LC parallel resonant circuit connected between the output terminal and a ground terminal in parallel to the amplification device; and

an LCR series resonant circuit connected between the output terminal and the ground terminal in parallel to the amplification device and the LC parallel resonant circuit.

The applied references, whether taken alone or in combination, neither disclose nor suggest the above features.

The background merely describes a wide-band amplifier that includes an inductor, capacitor and resistor connected in parallel to an amplification device.[1] As acknowledge in the outstanding Office Action, however, the background does not describe a LCR series resonant circuit connected between the output terminal and a ground terminal of the wide-band amplifier, in parallel to the amplification device and the LC parallel resonant circuit.[2] Nevertheless, the outstanding Office Action identifies Feld as describing these features.

Feld describes a high-frequency power amplifier that feeds an antenna of a nuclear resonance tomography apparatus.[3] Feld describes that the power amplifier includes an amplifier stage (2) coupled to a high-frequency load (G_L) via a matching network (8).[4] The matching network (8) includes a parallel resonant circuit (20) connected in parallel to the output of the amplifier stage (2), and a series resonant circuit (22) connected in series between the output of the amplifier stage (2) and the high-frequency load (G_L).[5] In operation, Feld describes that the amplifier stage (2) operates in two *relatively narrow* frequency bands

[1] *See* paragraph 10 and Figure 8.
[2] *See* the outstanding Office Action at pages 2-3.
[3] Feld at column 1, lines 5-10.
[4] Feld at column 5, lines 20-30; see also Figure 2.
[5] Feld at column 6, lines 45-52; see also Figure 5.

having center frequencies of (f_1 and f_2), and the matching network (8) transforms the high-frequency impedance (G_L) into a lower impedance (G'_L) to ensure maximum peak power delivery by the amplifier stage (2) to the load (G_L).[6] Feld also describes that the high-frequency load (G_L) corresponds to the high-frequency antenna connected to the output matching network (8).[7] Thus, Feld describes a matching network (8) to match the high-frequency antenna impedance to the output impedance of the amplifier stage (2).[8]

Feld, however, does not describe that the series resonant circuit (22) is connected in parallel to the output of the amplifier stage (2) as the outstanding Office Action contends. Instead, Feld very clearly illustrates that the series resonant circuit (22) is connected in *series* between the amplifier stage (2) and the high-frequency antenna, represented by the high-frequency load (G_L).[9] In fact, Feld requires that the series resonant circuit (22) be connected in series between the amplifier stage (2) and the high-frequency load (G_L) in order to both match the output impedance of the amplifier stage (2) to the high-frequency load (G_L) and to provide DC voltage separation from the high-frequency load (G_L).[10] Nowhere, however, does Feld describe that the high-frequency load (G_L) is connected in parallel to the series combination of the series resonant circuit (22) and the high-frequency load (G_L). In fact, Feld clearly describes the high-frequency load (G_L) as being the high-frequency antenna to which the output of the power amplifier is connected.[11] As such, the output of the high-frequency power amplifier described in Feld could only be the terminals of the high-frequency load (G_L). Conversely, amended Claim 1 recites an amplifier device connected in series between the input terminal and the output terminal where an output of the amplification device is directly connected to the output terminal, and both an LC parallel resonant circuit and an

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[6] Feld at column 5, lines 5-10 and lines 45-55.
[7] Feld at column 5, lines 45-50.
[8] Feld at column 5, lines 25-31.
[9] *See* Figure 5 of Feld.
[10] Feld at column 5, lines 19-55 and column 7, lines 44-47.
[11] Feld at column 5, lines 25-30.

LCR series resonant circuit are connected between the output terminal and a ground terminal. Therefore, Feld fails to disclose the claimed LCR series resonant circuit, and amended Claim 9 is believed to be in condition for allowance.

Furthermore, Feld describes a narrow-band amplifier. In fact, Feld describes that the matching network (8) is *incapable of maintaining the correct impedance match for a continuous frequency range.*[12] Thus, Feld requires that the frequency range of amplification be kept narrow, and describes the amplifier as operating in two discrete, relatively narrow frequency bands (f_1, f_2).[13] Thus, Feld teaches away from using the LC parallel resonant circuit and LCR series resonant circuit in a wide-band amplifier, as recited in amended Claim 9, because Feld describes such an arrangement as being incapable of maintaining proper impedance matching over the wide band.

> "A reference may be said to teach away when a person of ordinary skill in the art, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 31 U.S.P.Q. 2d 1130, 1131 (Fed. Cir. 1994).

Thus, it is submitted that one of ordinary skill would be discouraged from combining the background with the impedance matching network (8) of Feld because Feld describes the impedance matching network (8) being suitable only for narrow-band amplifiers, not wide-band amplifiers. Therefore, the combination of the background and Feld is believed improper, and amended Claim 9 is believed to be in condition for allowance for this additional reason. Accordingly, it is respectfully requested that the rejection of Claim 9 under 35 U.S.C. § 103(a) be withdrawn.

With respect to the rejection of Claim 14 as being unpatentable over the background in view of Kasuga, this rejection is respectfully traversed.

Claim 14 is directed to a wide-band amplifier that includes:

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[12] Feld at column 3, lines 30-42.
[13] Feld at column 3, lines 40-45; column 5, lines 5-10.

an input terminal configured to receive an input voltage;

an output terminal configured to provide an output voltage;

an amplification device connected in series between the input terminal and the output terminal; and

an analog band-pass filter connected between the output terminal and a ground terminal in parallel to the amplification device, the analog band-pass filter having a plurality of poles provided on a left side of an s-plane and a plurality of zeros arranged between the poles, at least two zeros being arranged at locations other than an origin of the s-plane.

As discussed above, and acknowledged in the outstanding Office Action, the background does not describe the claimed analog band-pass filter.[14] However, the outstanding Office Action identifies Kasuga as describing these features.

Kasuga describes a digital equalizer having poles and zeroes arbitrarily arranged along a circle circumference whose radius is the center angular frequency of a desired filter characteristic.[15] Kasuga describes that an analog signal is digitized and held in a register (21) from which samples are successively applied to delay devices (22, 23) in a cascade direction and delayed by a sampling period (T).[16] Outputs of the register (21), delays (22, 23) and delays (30, 31) are time-division-multiplexed into a multiplier (25), and then added to previous sample outputs stored in register (28).[17] The equalizer (29) output is also fed back to delay (30).[18]

Kasuga, however, does not describe an analog band-pass filter with a plurality of zeroes arranged between poles on a left side of the s-plane, where at least two of the zeroes are arranged at locations other than the origin of the s-plane. In fact, Kasuga does not describe analog filters with zeroes at locations other than the origin of the s-plane, or

[14] See the outstanding Office Action at page 7.
[15] Kasuga at column 1, lines 43-50.
[16] Kasuga at column 12, lines 40-51.
[17] Kasuga at column 12, lines 52-61.
[18] Kasuga at column 12, lines 60-67.

infinity.[19] Kasuga describes this as being one of the drawbacks of using analog filter design to design digital filters.[20] Therefore, any combination of the background and Kasuga requires modification of the background to include a digital filter implementing the desired filter characteristic, and *fundamentally change the principle of operation* of the background from one of an analog filter to one of a digital filter.

> If the proposed modification or combination of the prior art *would change the principle of operation of the prior art invention being modified*, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). (Emphasis added.)

The proposed combination would modify the analog circuit illustrated in Figure 8 of the background to include at least those digital components illustrated in Figure 9 of Kasuga.[21] The outstanding Office Action, however, provides no rationale as to how such a combination can be made without significant modification to one or both of the above-described circuits, and a complete change in principle of operation thereof. Indeed, such a modification would at least modify the circuit of Figure 8 from an analog to a digital one. As such, it is submitted that the combination of the background with Kasuga is improper, and that a *prima facie* case of obviousness with regard to Claim 14 has not been made. Accordingly, Claim 14 is believed to be in condition for allowance, and it is therefore respectfully requested that the rejection of Claim 14 under 35 U.S.C. § 103(a) be withdrawn.

As all other rejections of record rely upon Feld and Kasuga for describing the above-distinguished features, and the above-distinguished features are neither disclosed nor suggested by Feld or Kasuga, alone, in combination, or in combination with any other art of record, it is respectfully submitted that a *prima facie* case of obviousness with respect to

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[19] Kasuga at column 1, lines 14-36.
[20] *Id.*
[21] *See* Figure 8 of the background and Figure 9 of Kasuga.

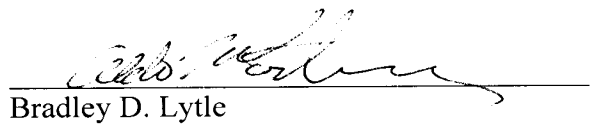
Claims 10-13 and 15-20 cannot be maintained. Therefore, it is respectfully requested that the rejection of Claims 10-13 and 15-20 under 35 U.S.C. § 103(a) be withdrawn.

For the reasons discussed above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance for Claims 9-20 is earnestly solicited.

Should, however, the above distinctions be found unpersuasive, Applicants respectfully request that the Examiner provide an explanation via Advisory Action under MPEP § 714.13 specifically rebutting the points raised herein.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, L.L.P.



Bradley D. Lytle
Attorney of Record
Registration No. 40,073

Aldo Martinez
Registration No. 61,357

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/09)

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